

## **APPENDIX C**

### **FIRE PREVENTION PROCEDURES AND PRACTICES**

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**CONTENTS**

C. 1	Fire Watch Requirements.....	C- 5
C. 2	Portable Heaters.....	C- 7
C. 3	Cutting, Welding, and Open Flame Work.....	C- 9
C. 4	Maintenance for Ventilation, Exhaust, and Blower Systems.....	C- 11
C. 5	Flammable and Combustible Liquids.....	C- 13
C. 6	Employee Training.....	C- 17
C. 7	Control of Combustibles.....	C- 19
C. 8	Compressed Gas Cylinders.....	C- 21
C. 9	Smoking Policy.....	C- 23
C. 10	Construction Sites.....	C- 25

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## APPENDIX C

### FIRE PREVENTION PROCEDURES AND PRACTICES

The following procedures serve as examples and may be used to any degree to assist in developing new or improving existing programs.

#### C. 1 Fire Watch Requirements

##### 1. 0 SCOPE

This procedure provides the requirements for a fire watch in facilities where automatic fire protection or alarm systems are installed but are out of service and the affected area is unattended. (see Section D. 5, "Fire Protection System Impairments")

*When developing this procedure, the Atomic Energy Commission Fire Protection Guide for Watchman Service may be useful in determining the appropriate frequencies and level of fire watch recommended based on the importance of the facility, occupancy hazard, loss potential, and the protection impaired.*

##### 2. 0 REQUIREMENTS

Management shall ensure the following are accomplished:

1. Fire watches understand the specific nature of the impairment and the specific area affected.
2. Fire watches for fire system impairments shall cover all areas affected by the impairment.
3. Fire watches have been instructed in the appropriate emergency actions, including best method to sound the alarm, procedure to manually trip suppression systems if they are in service, or use of portable extinguishers.
4. Fire watches have been instructed in the frequency of the fire watch tours.
5. Fire watches have had portable fire extinguisher training.
6. Frequency of tours are as follows:
  - a. Continuous, when required by facility process standards or process controls
  - b. Hourly, when automatic suppression systems are out of service

- c. Once every 2 hours if only automatic alarm capability is out of service
  - d. As amended by Fire Protection Engineering.
- 7. A log or documentation system is used to provide an audible record that ensures compliance.
  - 8. Fire watches for welding, cutting, grinding, or open flame activity shall be performed per Section C. 3, "Cutting, Welding, and Open Flame Work. "

## C. 2 Portable Heaters

### 1. 0 SCOPE

This procedure provides the minimum requirements for the safe use of portable heaters.

### 2. 0 REQUIREMENTS

Management shall ensure the following are accomplished.

1. Fire Protection Engineering is consulted regarding size and spacing of heaters.
2. Manufacturer's recommendations are observed for the following:
  - a. Adequate clearance to combustible furnishings, surfaces, or materials
  - b. Adequate ventilation for fuel-fired heaters to prevent products of combustion buildup and to maintain stable flame quality.
3. Heaters are Underwriters Laboratories (UL) listed or American Gas Association (AGA) certified.
4. Fuel for heaters is stored and handled in accordance with the requirements for Section C. 5, "Flammable and Combustible Liquids."
5. Fuel-fired heaters are located outside and heat is ducted indoors, unless otherwise approved by Fire Protection Engineering.
6. Indoor use of liquid petroleum gas fired heaters is temporary and only under the following conditions:
  - a. In buildings under construction, or undergoing repairs or modifications.
  - b. As temporary heat in noncombustible industrial occupancies.
  - c. In other buildings for temporary emergency heating purposes, if necessary, to prevent damage to the building or contents. A fire watch must be provided.
7. Portable electric heaters are equipped with tip-over protection, which automatically shuts the unit off when the unit is tipped from its upright position.

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## C. 3 Cutting, Welding, and Open Flame Work

### 1. 0 SCOPE

This procedure provides the requirements and responsibilities for cutting and welding with electric arcs, oxygen-fuel gas flames, and other forms of hot work such as open flames, grinding, or brazing activities. The scope of this procedure also requires compliance with NFPA 51B and the applicable Compressed Gas Association publications.

### 2. 0 REQUIREMENTS

Management and craft supervisors shall ensure the following are accomplished.

1. Cutting and welding are done by authorized personnel in designated cutting and welding areas (shops) to the greatest extent practical.
2. Adequate ventilation is provided for all cutting and welding work.
3. Torches, regulators, pressure-reducing valves, and manifolds are UL listed or Factory Mutual (FM) approved.
4. Oxygen-fuel gas systems (e.g., oxygen or acetylene welders) are equipped with listed and/or approved backflow valves and pressure-relief devices.
5. Eye protection and protective clothing are worn by all cutters, welders, helpers, and fire watches, as appropriate. Workers adjacent to arc welding areas are protected from the rays by screens or shields.
6. When cutting and welding are done outside of designated areas, the following actions are performed.
  - a. A permit is completed for each shift.
  - b. A continuous fire watch is maintained by instructed employees. The fire watch shall be stationary at the hazard area, and in addition, a roaming watch shall be provided when warranted. A fire is attacked only when obviously within the capability of the portable extinguisher. See Section C. 1, "Fire Watch Requirements."
  - c. A member of supervision (i.e., craft supervisor) inspects the job site at least once before the start of each job and at least once every 24 hours until the completion of the job.
  - d. A craft supervisor determines the best locations(s) for the fire watch and verifies that automatic fire protection is in service, that precautions taken are adequate, and that

information on the permit is correct.

- e. Combustible materials, equipment, or building surfaces within 20 ft of or below the work must be either covered with fire-resistant welding blankets, moved, or wetted down. Openings in ducts, tanks, or other confined spaces within 20 feet of the work are also covered or plugged. Fire-resistant welding blankets are used for electric arc operations instead of wetting the work down.
7. Cutting or welding is prohibited in the following situations.
- a. In sprinklered areas while sprinkler protection is out of service
  - b. In explosive atmospheres of gases, vapors, or dusts or where explosive atmospheres could develop from residues or accumulations in confined spaces (see item 8)
  - c. On metal walls, ceilings, or roofs built of combustible sandwich-type panel construction or having combustible covering.
8. Confined spaces such as tanks are tested to ensure that the atmosphere is not in excess of 10% of the lower flammable limit before cutting or welding in or on the tank. Tests are repeated as conditions warrant, once each shift as a minimum. Mechanical ventilation is continuous when cutting or welding in or on a confined space.
9. When cutting or welding must be done on small tanks, piping, or containers that cannot be entered, they are cleaned, purged, and tested before starting the work. For work on combustible liquid, gas piping, or tanks, intermittent testing is done during the work and a Job Safety Analysis provided.

## C. 4 Maintenance for Ventilation, Exhaust, and Blower Systems

### 1. 0 SCOPE

This procedure provides the requirements for inspecting and cleaning building ventilation, exhaust, and blower systems to mitigate potential fire hazards. This standard applies to ventilation systems (including intake and exhaust openings, plenums, etc.) for changerooms, exhaust and blower systems in laboratories, paint booths, metal and woodworking areas, and other similar areas where flammable or combustible vapors, residues, lint, and/or fibers accumulate. The scope of this procedure also requires compliance with the applicable sections of the following NFPA standards:

- NFPA 90A, "Installation of Air Conditioning and Ventilating Systems"
- NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems"
- NFPA 91, "Installation of Blower and Exhaust Systems for Dust, Stock, and Vapor Removal or Conveying"
- NFPA 96, "Installation of Equipment for the Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment"

NOTE: Ducts with known radiological contamination are excluded from this standard, except where the potential fire hazard is severe. Fire Protection Engineering requirements for HEPA filtration systems are provided in the "Fire Protection Criteria for Containment Ventilation Filter Plenum Systems" located in the DOE Fire Protection Resource Manual.

### 2. 0 REQUIREMENTS

Management shall ensure that:

1. All building ventilation, exhaust, and blower systems where flammable or combustible vapors, residues, lint, and/or fibers accumulate are identified and documented.
2. All systems identified in item 1, above, are included in a minimum, annual preventive maintenance (PM) program. The frequency must be increased when conditions warrant.
3. The PM includes an inspection of all components of the systems and is documented for auditing purposes.
4. The PM includes, but is not limited to, cleaning grill plates, replacing filter media if design permits, and removing any buildup of foreign material from the duct interior if conditions warrant.
5. A list of all systems, identified in item 1 above, is forwarded to Fire Protection Engineering.

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## C. 5 Flammable and Combustible Liquids

### 1. 0 SCOPE

This procedure provides the requirements for the use, storage, and handling of flammable and combustible liquids. The scope of this procedure also requires compliance with NFPA 30, NFPA 45, and NFPA 395.

### 2. 0 REQUIREMENTS

Management shall ensure that the following are accomplished.

1. Users of flammable and combustible liquids are familiar with the hazard classification for the purpose of complying with this standard.

NOTE: Flammable and combustible liquids are classified as follows.

- a. Flammable Liquid. A liquid having a flash point below 100 °F (37.8 °C) and having a vapor pressure not exceeding 40 psi (absolute) (2,068 mm Hg) at 100 °F (37.8 °C) is known as a Class I liquid.

Class I liquids are subdivided as follows.

- Class IA liquids include those having flash points below 73 °F (22.8 °C) and having a boiling point below 100 °F (37.8 °C).
- Class IB liquids include those having flash points below 73 °F (22.8 °C) and having a boiling point at or above 100 °F (37.8 °C).
- Class IC liquids include those having flash points at or above 73 °F (22.8 °C) and below 100 °F (37.8 °C).

- b. Combustible Liquid. A liquid having a flash point at or above 100 °F (37.8 °C).

Combustible liquids are subdivided as follows.

- Class II liquids include those having flash points at or above 100 °F (37.8 °C) and below 140 °F (60 °C).
- Class IIIA liquids include those having flash points at or above 140 °F (60 °C) and below 200 °F (93 °C).

- Class IIIB liquids include those having flash points at or above 200 °F (93 °C).

- The following storage requirements are implemented.
    - In industrial facilities, not more than a 1-day supply of flammable or combustible liquid may be stored in a single fire area outside of an approved flammable liquid storage cabinet; or not more than 25 gal of Class I liquids in containers and 120 gal of Class IB, IC, II, or III liquids in containers.
    - If quantities of liquids exceeding the above limits are required, they must be stored in approved flammable liquid storage cabinets.
  - When flammable liquid storage cabinets are used, not more than 120 gal of Class I, II, and IIIA liquids are stored in the cabinet. Of this total, not more than 60 gal may be of Class I and II liquids.
  - When flammable liquid storage cabinets are used, not more than three cabinets may be stored in a single fire area. In industrial facilities, additional cabinets (limited to a maximum group of three) may be stored in the same fire area, provided the groups of cabinets are separated by 100 ft.
  - When flammable liquid storage cabinets are used, the vent openings must be sealed with properly fitted metal bungs; or when the cabinets are required to be vented, they must be vented to the outside.
  - When storage quantities exceed that permitted in items 2 and 4 above, the liquids are stored in rooms or facilities complying with NFPA 30 and 29 CFR 1910.106, "Flammable and Combustible Liquids."
  - All flammable and combustible liquids (except Class IIIB) in nuclear facilities are stored in approved flammable liquid storage cabinets, rooms, or buildings complying with NFPA 30 and 29 CFR 1910.106.
- NOTE: This requirement does not apply to laboratories.
- When dispensing from drums, the drums are equipped with UL-listed or FM-approved dispensing devices.
  - When transferring liquids between conductive containers, the containers are bonded with a wire. The bonding wire or one of the containers must be grounded.
  - Class IA and IB liquids may be stored in glass containers of not more than 1 gal, if required for liquid purity or to avoid excessive corrosion of metal containers.
  - Stored liquids should not obstruct corridors, aisles, or exit doors,

and should not be stored in exit enclosures (e.g., stairwells).

12. When transferring Class I liquids in laboratories from containers of less than 5-gal capacity, the transfer is made in one of the following manners:
  - a. With the use of a laboratory hood
  - b. In an area provided with ventilation to prevent the accumulation of a flammable vapor or air mixture exceeding 25% of the lower flammable limit.
13. When transferring Class I liquids in laboratories from containers of 5-gal capacity or more, the transfer is made in one of the following manners:
  - a. From a separate area outside the building
  - b. In a separate, inside storage room that complies with the requirements of NFPA 30 and 29 CFR 1910.106.
14. Mechanical ventilation that meets the following criteria is provided when transferring Class I liquids in nonlaboratory areas.
  - a. The ventilation flow rate must be  $1 \text{ ft}^3/\text{min}/\text{ft}^2$  of floor area but in no case less than  $150 \text{ ft}^3/\text{min}$ .
  - b. The intake and exhaust points must be within 12 in. of the floor and positioned at opposite sides or ends of the room.
  - c. A flow monitor or equivalent mechanism must be provided so an audible alarm will sound if the ventilation system fails.
15. Combustible waste and residue is stored in closed, metal containers for daily disposal.
16. Outdoor storage requirements comply with NFPA 30 and 29 CFR 1910.106. NOTE: Contact Fire Protection Engineering for assistance.
17. Inside storage rooms comply with NFPA 30 and 29 CFR 1910.106. NOTE: Contact Fire Protection Engineering for assistance.

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## **C. 6 Employee Training**

### **1. 0 SCOPE**

This procedure outlines the annual fire protection training requirements for employees.

### **2. 0 REQUIREMENTS**

Management shall ensure that the following are accomplished.

1. All employees receive basic fire prevention training, which includes the following items as a minimum:
  - a. Good housekeeping practices
  - b. Proper response and notification in the event of a fire
  - c. Instruction on the use of portable fire extinguishers
  - d. Recognition of potential fire hazards.
2. Employees who perform fire watches receive hands-on portable fire extinguisher training.
3. All training is documented for auditing purposes.

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## **C. 7 Control of Combustibles**

### **1. 0 SCOPE**

This procedure provides the requirements for minimizing and controlling the use of combustible materials. The scope of this procedure also requires compliance with the applicable sections of NFPA 1.

### **2. 0 REQUIREMENTS**

Management shall ensure that the following are accomplished.

1. Housekeeping inspections are performed monthly in their facilities to ensure equipment and materials are maintained in an orderly arrangement at all times.
2. At least 18 in. vertical clearance is maintained between the top of storage and sprinkler head deflectors.
3. Combustible materials are limited to the quantity required for current needs and are separated from ignition sources.
4. Workroom floors are maintained clean and dry to the extent practicable.
5. Noncombustible or fire retardant materials are used whenever possible.
6. Combustible waste is collected in metal containers and provided with lids. (Lids are not required for office waste cans.)
7. Combustible waste does not accumulate inside or adjacent to buildings.
8. In nuclear facilities, wood, plastic, and paper materials are strictly limited for uses that are essential to the facilities operation and to uses that do not have a noncombustible substitute.

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## C. 8 Compressed Gas Cylinders

### 1. 0 SCOPE

This procedure provides the requirements for the storage, transportation, identification, and use of compressed gas cylinders. The design, use, and storage of compressed gas cylinders and systems shall comply with the following standards as applicable:

NFPA 50, "Bulk Oxygen Systems at Consumer Sites"  
 NFPA 50A, "Gaseous Hydrogen Systems at Consumer Sites"  
 NFPA 50B, "Liquefied Hydrogen Systems at Consumer Sites"  
 NFPA 51, "Design and Installation of Oxygen-Fuel Gas Systems for Welding Cutting and Allied Processes"  
 NFPA 51A, "Acetylene Cylinder Charging Plants"  
 NFPA 51B, "Cutting and Welding Processes"  
 NFPA 52, "Compressed Natural Gas Vehicular Fuel Systems"  
 NFPA 54, "National Fuel Gas Code"  
 NFPA 58, "Storage and Handling of Liquefied Petroleum Gases"  
 NFPA 59, "Storage and Handling of Liquefied Petroleum Gases at Utility Gas Plants"  
 NFPA 59A, "Production, Storage and Handling of Liquefied Natural Gas"  
 Compressed Gas Association Publications

### 2. 0 REQUIREMENTS

Management shall ensure that the following are accomplished.

1. Cylinders in transit or storage are provided with protective valve caps and secured in the upright position.
2. All storage areas are clearly identified.
  - a. The storage of compressed gas cylinders within buildings shall be limited to the quantity required for daily operations unless additional quantities are permitted by the applicable NFPA standard.
  - b. The storage of compressed gas cylinders outside of buildings shall be in accordance with the applicable NFPA standard.
3. Flammable and oxidizing compressed gas cylinders are separated by 20 ft or with a minimum 5-ft-high, 30-minute fire rated wall.
4. Empty and full gas cylinders are segregated, and empty cylinders are tagged "empty."
5. Compressed gas cylinders are not exposed to temperatures above 125 °F and are protected from direct sun and weather elements.
6. Compressed gas cylinders are identified regarding their contents;

they are free of defects and are within their hydrostatic test date.

7. Gases are not mixed or transferred from one compressed gas cylinder to another and are refilled only by trained personnel.
8. Cylinders are not lifted by magnetic devices or by their protective caps. They must be secured to a cradle or platform and never dragged, dropped, or struck.
9. Compressed gas cylinders do not come in contact with electrical circuits, open flames, or arcs.
10. Compressed gas cylinders are not used for any purpose other than compressed gas containment.
11. Gas is not used from compressed gas cylinders without approved reducing regulators.
12. Connecting devices are free of oil, grease, and dirt and have threads corresponding to the cylinder valving.
13. Valves must be closed when cylinders are transported, moved at sites, and connected for use.
14. All devices used on compressed gas cylinders comply with the American National Standards Institute and Compressed Gas Association standards.
15. All compressed gas manifolds are designed in accordance with the applicable NFPA standard.

## **C. 9    Smoking Policy**

### **1. 0    SCOPE**

This procedure provides the company's smoking policy. The scope of this procedure also requires compliance with the applicable sections of NFPA 1.

### **2. 0    REQUIREMENTS**

1.    Smoking is prohibited in the following Government owned, leased, or controlled areas:
  - a.    All indoor rooms and offices
  - b.    All government vehicles
  - c.    Near hazardous or toxic materials.
2.    Adequate resources shall be supported by the company to aid employees in smoking cessation or curtailment should they request this assistance.
3.    Designate areas where smoking is permitted.

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## **C. 10 Construction Sites**

### **1. 0 SCOPE**

This procedure provides the fire prevention requirements for construction sites. The scope of this procedure also requires compliance with the applicable sections of NFPA 241 and 29 CFR 1926.

### **2. 0 REQUIREMENTS**

The project manager shall ensure that the following are accomplished.

1. Access is always maintained to the site for Emergency Response vehicles.
2. The site or project is provided with two-way communications for the purpose of emergency notification.
3. The site or project is secured against unauthorized entry.
4. Welding, cutting, and open flame is performed in a designated area whenever possible.
5. The site or project is provided with portable firefighting equipment.
6. When water is available, the site or project is provided with an adequate supply (including an adequate number of fire hydrants strategically located at the site) for firefighting capability.
7. Projects involving multiple level buildings are provided with dry standpipe systems. (Consider the limitations of the site fire department or brigade when determining the need for dry standpipes in multiple level buildings during construction.)
8. Construction site safety inspections are conducted weekly and documented, and any unsafe conditions identified are tracked until corrected.

## **APPENDIX D**

### **FIRE PROTECTION PROCEDURES AND PRACTICES**

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**CONTENTS**

D. 1	Portable Fire Extinguishers.....	D- 5
D. 2	Nonemergency Use of Fire Hydrants.....	D- 7
D. 3	Building Exits.....	D- 9
D. 4	Building Emergency Lights.....	D- 11
D. 5	Fire Protection System Impairments.....	D- 13
D. 6	Fire Protection System Winterization.....	D- 15
D. 7	Fire Barriers.....	D- 17
D. 8	Building Standpipe Systems.....	D- 19

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## APPENDIX D

### FIRE PROTECTION PROCEDURES AND PRACTICES

#### D. 1 Portable Fire Extinguishers

##### 1. 0 SCOPE

This procedure provides the requirements and responsibilities for the installation and maintenance of portable fire extinguishers. The scope of this procedure also requires compliance with NFPA 10.

##### 2. 0 REQUIREMENTS

Management shall ensure that the following are accomplished.

1. The location and type of portable fire extinguisher are in accordance with the requirements of NFPA 10. The relocation of any portable fire extinguisher must be approved by Fire Protection Engineering.
2. Portable fire extinguishers are inspected and maintained.
3. Before purchase, portable fire extinguishers are approved by Fire Protection Engineering.
4. Portable fire extinguishers are inspected monthly. If inspection forms are used, they shall be maintained for 1 year and be available on request.
5. Portable fire extinguishers are within their hydrostatic test date and maintained in a fully charged and operable condition.
6. Portable fire extinguishers are mounted on hangers or in cabinets, unless they are the wheeled types. Portable fire extinguishers that are used for welding and cutting operations are not required to be secured at the location of the welding or cutting.
7. Portable fire extinguishers that are provided for vehicles are mounted or secured to prevent physical damage to the extinguisher and injury to passengers.
8. Portable fire extinguishers are conspicuously marked and identified.
9. Portable fire extinguishers are not obstructed or obscured from view, and clear access to the portable fire extinguisher is maintained.

10. Immediate corrective action is taken for portable fire extinguishers identified as having a deficiency (e.g., empty, not mounted or missing, broken seal, etc.).
11. Employees receive fire extinguisher training upon initial employment. Thereafter, employees who may use a portable fire extinguisher must be given a documented refresher class annually.

## **D. 2 Nonemergency Use of Fire Hydrants**

### **1. 0 SCOPE**

This procedure provides the requirements and responsibilities for nonemergency use of fire hydrants.

### **2. 0 REQUIREMENTS**

Management shall ensure that the following are accomplished.

1. Prior permission is obtained from the Fire Department and the site Water Department before nonemergency use of fire hydrants.
2. The hydrant user installs one valve (4 1/2-in. American national fire hose connection screw thread (NH) with a 4-in. Storz-type, i.e., sexless quick coupling) to a 4 1/2-in. port on each fire hydrant being used. This 4 1/2-in. port with the valve installed is reserved for fire department use only.
3. One or both 2 1/2-in. fire hydrant ports are used for nonemergency use only; the 4 1/2-in. port is used only by the fire department. The hydrant user provides an approved 2 1/2-in. gate valve (NH both ends) on one or both of the 2 1/2-in. fire hydrant ports, reduced down to 1 1/2 in. (i.e., a 2 1/2-in. NH gate valve followed by a 2 1/2-in. X 1 1/2-in. NH reducer).
4. The user provides and uses only approved fire hydrant wrenches when opening or closing a fire hydrant (i.e., no pipe wrenches are to be used).
5. The user keeps the fire hydrant in a fully open or fully closed configuration.
6. An approved portable backflow device or air gap is used to protect the potable water system from potential backflow conditions, where water for purposes such as flushing drains, filling tankers, etc., is drawn from a fire hydrant that is connected to a potable water system.
7. Special precautions are taken during freezing weather conditions to prevent fire hydrant damage. Do not leave the fire hydrant and any attached hoses pressurized in a nonflowing condition for an extended length of time.



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## **D. 3 Building Exits**

### **1. 0 SCOPE**

This procedure provides the requirements and responsibilities for maintaining safe building exits. The scope of this procedure also requires compliance with NFPA 101. Compliance with 29 CFR 1910, Subpart E is considered satisfied when the requirements of NFPA 101 are met.

### **2. 0 REQUIREMENTS**

Management shall ensure that the following are accomplished.

1. Every building exit and path to an exit is kept clear and unobstructed.
2. Building exit doors are not locked and do not require more than one action to open.
3. Exit doors are maintained in good operating condition.
4. Material is not stored in stairwells or corridors of buildings.
5. Emergency lights, exit signs, and other exit marking systems are maintained in good operating condition.
6. Fire doors are not blocked open.
7. Exit discharges including exterior building stairs are kept clean and unobstructed.
8. Radiation barriers (e.g. roped areas, etc.) do not affect egress routes.
9. Security features are in compliance with NFPA 101.

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## **D. 4 Building Emergency Lights**

### **1. 0 SCOPE**

This procedure provides the requirements and responsibilities for battery-operated and emergency-generator-operated emergency lighting systems.

The scope of this procedure also requires compliance with the applicable sections of NFPA 101, NFPA 70, and NFPA 110.

### **2. 0 REQUIREMENTS**

Management shall ensure that the following are accomplished.

1. All emergency light tests are documented and written records maintained.
2. Emergency lights that are found deficient are repaired within 24 hours, or portable emergency lights are provided at the affected area(s) until the permanent lights are restored to service.
3. Emergency lights are inspected during emergency light tests to verify the following:
  - Electrical cords are not damaged or frayed
  - Lamps are not cracked or damaged
  - Units are securely mounted
  - Lamps illuminate within 10 seconds of switching to the backup power supply.

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## **D. 5 Fire Protection System Impairments**

### **1. 0 SCOPE**

This procedure provides the requirements and responsibilities to minimize the duration and impact of modifications or unplanned impairments to fire protection systems.

### **2. 0 REQUIREMENTS**

Management shall ensure that the following are accomplished.

1. Fire protection system modifications are reviewed and approved by Fire Protection Engineering.
2. Fire protection system operation is not hindered by storage practices, temporary construction activities, or enclosures.
3. Corrective actions are implemented for all fire protection system impairments.
4. The craft personnel, Fire Department, and necessary engineering support are coordinated to properly and expeditiously restore the fire protection system to service.
5. Fire Protection Engineering and the Fire Department are immediately notified of all fire protection system impairments.
6. Compensatory measures are implemented as required by Fire Protection Engineering until the system is restored.
7. When a fire protection system impairment is identified, the facility manager shall initiate corrective actions as soon as possible. Corrective actions shall consist of, but not be limited to, the following.
  - a. Notify the building occupants affected by the impairment.
  - b. Determine when any unsatisfactory housekeeping, storage, or special hazardous conditions need to be corrected.
  - c. As necessary, terminate hazardous production or maintenance operations and impose "No Smoking" regulations until appropriate protection or detection is restored. Cutting, welding, or other "hot work" shall be prohibited until adequate protection is assured.
  - d. With Fire Protection Engineering consultation, determine when the Fire Department should be present at the facility and/or provide alternate water supplies to the impaired system.

- e. Maintain as much of the fire protection system in an operable status as possible.
- f. Establish a fire watch throughout the area that is affected by the impairment of the fire protection system as required by Fire Protection Engineering. (See Section C. 1, "Fire Watch Requirements.")

## D. 6 Fire Protection System Winterization

### 1. 0 SCOPE

This procedure provides the requirements for developing a winterization program to ensure fire systems are protected against cold weather conditions.

The standard applies to all government-owned facilities provided with fire protection systems and components e.g., sprinkler, deluge, foam systems, smoke detectors, or standpipes.

### 2. 0 REQUIREMENTS

Management shall ensure that the following are accomplished.

1. A written winterization program is in place for their facilities. The program shall require that each facility be inspected annually during the month of September to ensure all areas are adequately winterized. The inspection shall include the following items as a minimum:
  - a. Condition, operation, and adequacy of heating systems, e.g., forced air, radiant heaters, portable heaters.
  - b. Condition and operation of thermostats and filters
  - c. Condition/operation/installation of heat tape systems
  - d. Draining of sprinkler system drip lines and fire pump hose headers.

Audible inspection results shall be maintained for 2 years.

2. All areas where fire systems are present are provided with sufficient heat and/or noncombustible insulation to prevent freezing and/or equipment damage.
3. Heat tape and portable heaters are only used when no other preventive measures are immediately available. If used, these items must be listed or approved for their intended use.
4. Heat tape and portable heaters are not used as a permanent means of preventing system freezes. An engineered solution is provided for deficient areas, e.g., forced hot air, fixed radiant heaters, insulation, etc.



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## **D. 7 Fire Barriers**

### **1. 0 SCOPE**

This procedure provides the requirements to establish and ensure the integrity and continued operability of building fire barriers. The scope of this procedure also requires compliance with the applicable sections of NFPA 101 and NFPA 90A.

### **2. 0 REQUIREMENTS**

Management shall ensure that the following are accomplished.

1. All modifications or additions, which affect new or existing fire barriers, are reviewed and approved by Fire Protection Engineering.
2. All fire barrier penetrations are provided with approved, through-penetration firestops and/or are protected by approved operable fire door(s), fire damper(s), or fire window(s) having the appropriate fire-resistive rating(s).
3. Drawings for each building provided with fire barriers are prepared to show the location of all fire barriers.
4. Changes or modifications to installed fire barriers shall be controlled by administrative procedures.
5. Fire doors are identified and numbered.
6. Fire doors are not chocked or blocked open.
7. Security systems do not interfere with or affect the operation or integrity of fire doors (e.g., latch mechanisms), fire dampers, fire windows, or other fire protection system component.
8. Fire or smoke dampers are identified and numbered.
9. Fire or smoke dampers are not blocked open.
10. Inspection records of fire barrier penetration devices (fire doors and fire or smoke dampers) are maintained by the building administrator for auditing purposes.
11. Immediate attention is taken to resolve any deficiencies that involve fire barrier impairments.

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## D. 8 Building Standpipe Systems

### 1. 0 SCOPE

This procedure provides the requirements for installing fire hose lines, when fire hose lines are required to meet the fire protection goals of the program. The scope of this procedure also requires compliance with NFPA 14.

*At many DOE sites, building fire hose lines are not installed because site emergency response personnel and fire departments prefer not to use "in-house" lines, but would rather bring their own hoses for use in the fire. Some unique conditions may warrant the installation of hose lines, and these cases should be coordinated with the local fire department. Some codes require standpipes and/or hose lines to be installed in selected occupancies. When required, only the fire hose connections (without the hoses) are typically provided for fire department use to aid with manual firefighting efforts.*

### 2. 0 REQUIREMENTS

Management shall ensure that the following are accomplished.

1. The class of standpipe service provided for a facility is coordinated with the local fire department.
2. Standpipe systems are sized in accordance with NFPA 14.
3. Building fire hose connections are conspicuously identified and access to them is maintained clear and unobstructed.
4. Standpipes normally filled with water shall be protected against freezing by ensuring the water in the pipe is at or above 40 °F.

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## **APPENDIX E**

### **SPECIAL HAZARDS PROTECTION PROCEDURES AND PRACTICES**

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# CONTENTS

E. 1	Temporary Enclosures.....	E- 5
E. 2	Computer Facilities.....	E- 7
E. 3	Oxidizing Materials.....	E- 9
E. 4	Gloveboxes.....	E- 11
E. 5	Explosives.....	E- 13
E. 6	Transportation.....	E- 15
E. 7	Clean Rooms.....	E- 17
E. 8	Laboratories.....	E- 21
E. 9	Pyrophoric Materials.....	E- 23
E. 10	Portable Structures.....	E- 25
E. 11	Hazardous Material Storage.....	E- 27
E. 12	Hydrogen Systems.....	E- 29
E. 13	Records Storage.....	E- 31
E. 14	Aircraft.....	E- 33
E. 15	Lightning.....	E- 35
E. 16	Explosion Proof Electrical.....	E- 37
E. 17	Lasers.....	E- 39
E. 18	Paint Spray Operations.....	E- 41
E. 19	Dormitories.....	E- 43
E. 20	Decommissioning of Facilities.....	E- 45
E. 21	Combustion Controls.....	E- 47



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## APPENDIX E

### SPECIAL HAZARDS PROTECTION PROCEDURES AND PRACTICES

#### E. 1 Temporary Enclosures

##### 1. 0 SCOPE

This procedure provides the requirements and responsibilities for temporary enclosure fire protection. The scope of this procedure also requires compliance with the applicable sections of NFPA 241.

##### 2. 0 REQUIREMENTS

Management shall ensure that the following are accomplished.

1. Temporary enclosures erected within a facility are not structurally supported by piping arrangements designed for automatic sprinkler systems and other fire protection equipment.
2. The enclosure supporting structures are constructed of noncombustible or fire-retardant material approved by Fire Protection Engineering.
3. The coverings for enclosure walls, ceilings, and floors are of noncombustible or approved fire-retardant materials. Where plastic films are used, they must be approved by Fire Protection Engineering.
4. Enclosures and 10-ft-wide areas on the exterior of the enclosures are posted as "No Smoking" areas.
5. Combustible materials are not stored within the "No Smoking" areas.
6. Flammable and/or combustible liquids are kept to an absolute minimum and are stored in and dispensed from UL- or FM-approved safety cans. Flammable or combustible liquid-soaked clothes, rags, or waste are stored in UL- or FM-approved safety containers.
7. Combustible materials that are used in the enclosure operations (e.g., rags, paper products, etc.) are removed from the enclosure immediately after use or transported and stored in approved metal containers with lids. All combustible waste is removed from the enclosure after each work shift.
8. Exits are kept unobstructed at all times.

9. Cutting, welding, open flame, or grinding are not performed in enclosures without an approved permit.
10. Portable fire extinguishers are provided and positioned for easy visibility and access.

## E. 2 Computer Facilities

### 1. 0 SCOPE

This procedure provides the requirements and responsibilities for computer facility fire protection. The scope of this procedure also requires compliance with DOE/EP-0108, *Standard for Fire Protection of AEC Electronic Computer Data Processing Systems*. This procedure applies to facilities that have the following characteristics:

1. Designated as vital to the DOE mission
2. Required for security
3. Valued at \$1 million or more
4. Required for operations that could be performed by substitute methods, but the substitute methods would result in unacceptable delay or would involve significant additional expenditures for personnel, facilities, and equipment.

### 2. 0 REQUIREMENTS

Management shall assure that the following are accomplished.

1. Computer areas are posted as "No Smoking" areas.
2. Furniture in computer areas is metal and limited to what is required for efficient operations.
3. Waste containers are noncombustible and equipped with fire safety lids.
4. Waste containers are emptied daily.
5. Areas under the raised floor are inspected quarterly to ensure no combustibles have accumulated.
6. Office or computer supplies, forms, stationary, and other combustible supplies are not stored in the computer area.
7. Maintenance operations are not performed in the computer area, except for those repairs made directly to equipment that is impractical to remove from the area.
8. Records and tapes are not stored in the computer area, except those required for daily operations.
9. Records and tapes required for daily operations are stored in closed metal cabinets.

10. Computer areas have an equipment salvage plan in place for the reconditioning of equipment that is exposed to smoke and water.
11. Fire protection features are provided in accordance with standards DOE/EP-0108, *Standard For Fire Protection of AEC Electronic Computer Data Processing Systems* and NFPA 75.
12. Employees who normally work in computer facilities are familiar with the fire protection systems in their work area.
13. Computer facilities with raised floors are provided with floor lifters that are mounted near the room exit door.

## **E. 3    Oxi di zi ng   Ma te ri a l s**

### **1. 0    SCOPE**

This procedure provides the general requirements for storing liquid and solid oxidizing materials. The scope of this procedure also requires compliance with NFPA 43A and NFPA 43C.

### **2. 0    REQUIREMENTS**

Management shall ensure that the following are accomplished.

1. An emergency plan is in place for facilities storing oxidizing materials.
2. Storage facilities are labeled with the "Class" of oxidizer they contain. (Reference NFPA 43A)
3. Oxidizing material is not stored with noncompatible materials such as ordinary combustibles, flammable or combustible liquids, greases, etc. (This does not apply to approved packaging material.)
4. The total amount of oxidizing material for each "Class" does not exceed 2 tons in nonsprinklered buildings or 4 tons in sprinklered buildings.
5. Employees involved in the storage operation receive instruction on handling the material in a safe manner.
6. "No Smoking" signs are posted at the entrance and within the storage building.
7. Any wood construction in storage buildings that may come in contact with oxidizers is protected with a compatible material to prevent the wood from impregnation by the oxidizers.
8. Combustible waste and used or empty containers are not stored with the oxidizing material.

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## E. 4 Gloveboxes

### 1. 0 SCOPE

This procedure provides the design and operation requirements and responsibilities for the prevention of glovebox fires. The scope of this procedure also requires compliance with the Glovebox Fire Protection Criteria located in the DOE Fire Protection Resource Manual.

### 2. 0 REQUIREMENTS

Management shall ensure that the following are accomplished.

1. All new gloveboxes and windows are constructed of noncombustible or fire retardant materials.
2. Glovebox gloves are of Hypalon<sup>1</sup> or neoprene material.
3. Window size is held to a minimum consistent with good operator vision and maintenance needs.
4. Gloveboxes are equipped with fire protection. Reference the DOE Glovebox Fire Protection Criteria.
5. Only combustibles required for daily operations are permitted in a glovebox.
6. Transient combustibles in gloveboxes are kept in closed metal containers.
7. Combustible waste is removed from gloveboxes daily or placed in closed metal containers (see item 6).
8. Flammable and combustible liquids used in gloveboxes are stored and dispensed from approved safety cans.
9. Glovebox exhaust filter openings are equipped with fire screens.
10. Heat-producing equipment in gloveboxes (e.g., calciners, hot plates) are equipped with high temperature automatic shutoff devices, safety shutoff valves, or safety tip-over switches.

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<sup>1</sup>Hypalon is a trademark of E.I. Du Pont de Nemours & Co.



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## E. 5 Explosives

### 1. 0 SCOPE

This procedure provides the operation requirements and responsibilities for the manufacturer, storage, and use of explosive materials. The term explosive includes any material determined to be within the scope of Title 18, United States Code, Chapter 40 (18 USC 40), "Importance, Manufacture, Distribution, and Storage of Explosive Materials." It also includes any material classified as an explosive by the DOT Hazardous Material Regulations.

The scope of this procedure also requires compliance with the following standards as applicable:

NFPA 495, "Explosive Material Code"  
NFPA 498, "Explosive Motor Vehicle Terminals"  
49 CFR 100-199, "Transportation"

### 2. 0 REQUIREMENTS

Management shall ensure that the following are accomplished.

1. The manufacture, storage, and use of explosive materials are prohibited unless it can be done in a safe manner.
2. The safety of the explosive workers, general public, and environment in the vicinity of the explosive materials are the primary importance of the operations.
3. Smoking and flame producing equipment are not permitted in the vicinity where explosive materials are produced, handled, stored, or used.
4. All explosive materials that are not in the process of manufacture, being transported, or in use are kept in a storage magazine.
5. Storage magazines are of the proper construction and are properly located for the type and amount of explosive being stored.
6. The area around storage magazines is kept clear of brush, dry grass, leaves, or similar combustibles for a minimum distance of 25 ft.
7. Combustible materials are not stored within 50 ft of explosive magazines.
8. All electrical equipment used near explosive material complies with NFPA 70 for classified hazardous areas.

9. Precautions are taken to prevent accidental detonation of explosives from currents induced by radar and radio transmitters, lightning, adjacent power lines, dust and snow storms, or other sources of extraneous electricity. These precautions shall include the following:
  - a. Post signs warning against the use of mobile radio transmitters on all roads within 350 ft of explosive operations, as required.
  - b. Construct tools used in the handling of explosives of nonsparking materials.
  - c. Discontinue all handling of explosive materials during the approach and progress of an electrical storm. Move all personnel to a safe location.
  - d. Provide bonding and grounding straps for all equipment where explosive materials are processed and handled.
  - e. Ensure floorings are of nonsparking materials.

## E. 6 Transportation

### 1. 0 SCOPE

This procedure provides the requirements for transporting flammable and combustible liquids, compressed gases, explosives, and other hazardous materials. For the purpose of this procedure, a vehicle is defined as either a railcar, ship, or highway truck. The scope of this procedure also requires compliance with the following standards as applicable:

NFPA 30, "Flammable and Combustible Liquids Code"  
 NFPA 58, "Storage and Handling of Liquefied Petroleum Gases"  
 NFPA 59, "Storage and Handling of Liquefied Petroleum Gases at Utility Gas Plants"  
 NFPA 59A, "Production, Storage and Handling of Liquefied Natural Gas"  
 NFPA 77, "Static Electricity"  
 NFPA 303, "Marinas and Boat Yards"  
 NFPA 306, "Control of Gas Hazards on Vessels"  
 NFPA 307, "Marine Terminals, Piers and Wharves"  
 NFPA 327, "Cleaning or Safeguarding tanks and Containers"  
 NFPA 385, "Tank Vehicles for Flammable and Combustible Liquids"  
 NFPA 386, "Portable Shipping Tanks"  
 NFPA 495, "Explosive Materials Code"  
 18 USC 40, "Importation, Manufacture, Distribution, and Storage of Explosive Materials"  
 33 CFR 1-199, "Navigation and Navigable Waters"  
 46 CFR 1-199, "Shipping"  
 49 CFR 100-199, "Transportation"  
 49 CFR 393, 396, 397, "Transportation"

### 2. 0 REQUIREMENTS

Management shall ensure that the following are accomplished.

1. Flammable and combustible liquids, compressed gases, explosive, and hazardous materials are transported in the appropriate containers and vehicles with the proper valving, piping, hose, connectors, pumps, meters, dispensers, regulators, strainers, and emergency venting.
2. Materials are not stored or transported in a vehicle that is not in compliance with the DOT.
3. All vehicles and containers used for transporting any material covered by this procedure (regardless of quantity being transported, or whether loaded or empty) are conspicuously and legibly marked in accordance with the requirements of the DOT Hazardous Material Regulations.
4. Vehicle drivers and navigators are thoroughly trained and licensed in the proper method of operating, loading, and unloading the

vehicle.

5. Vehicles are not operated unless they are in proper repair, devoid of accumulation of grease and oil, and free of leaks.
6. Vehicle repairs are not made unless the repairs can be made without hazard.
7. Vehicle repairs are not performed in a closed building or with the vehicle loaded or unpurged.
8. Vehicles are bonded and grounded when required during loading and unloading operations.
9. Vehicles used for transporting materials covered by this procedure are designated as "No Smoking" areas.
10. Material is not transported from a land-based vehicle unless the parking brake is securely set, wheels blocked as required, and all other reasonable precautions have been taken to prevent motion of the vehicle.
11. Transportation vehicles are provided with at least one 20-B:C rated fire extinguisher, or two 10-B:C rated fire extinguishers, or one 2A-20B:C rated fire extinguisher.
12. Extinguishers are maintained in good operating condition (See Section D.1, "Portable Fire Extinguishers") and are accessible in the vehicle.
13. Material containers used in transportation are chemically compatible with the material being transported.
14. Transportation vehicles, except in an emergency situation, are not parked and left unattended adjacent to any building, street, highway, avenue, alley, water way, pier, wharf, or harbor facility that is not connected with the normal duties of the vehicle.
15. Vehicles used for transporting explosive materials are not exposed to spark producing surfaces on the inside of the transporting body.
16. Explosive materials are not transported through any prohibited vehicular bridge, roadway, or elevated highway.

## E. 7 Clean Rooms

### 1. 0 SCOPE

This procedure provides the fire protection requirements for clean rooms. A clean room is a controlled environment facility in which all incoming air particulates, room temperatures, pressures, and humidity are strictly regulated. The scope of this procedure also requires compliance with NFPA 318 and FM Data Sheets FM 1-56, "Clean Rooms," and FM 7-7, "Semiconductor Plants."

### 2. 0 REQUIREMENTS

Management shall ensure that the following are accomplished.

1. The interior finish of clean rooms has a flame spread rating of 25 or less and a smoke development of 50 or less in accordance with American Society for Testing and Materials (ASTM) E-84, *Test Method for Surface Burning Characteristics of Building Materials*.
2. Carpet and flooring used in clean rooms has a minimum average critical radiant flux of 0.45 W/cm<sup>2</sup> when tested in accordance with ASTM E-648, *Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source*.
3. Clean rooms are constructed of fire resistive or noncombustible construction and are separated from other occupancies by a minimum 1-hour fire rated construction.
4. All piping, duct work, and cables passing through fire rated construction are fire stopped or wrapped with the appropriate materials for the penetration rating. Fire dampers shall not be installed in exhaust ventilation systems.
5. Clean rooms are subdivided by 1-hour fire rated partitions into the smallest areas possible to limit damage from fire. The largest individual clean room should not exceed 10,000 ft<sup>2</sup>.
6. Clean rooms have an engineered smoke control system designed to exhaust 100% air in the fire area and simultaneously provide areas adjacent to the fire area with a 100% supply. This will ensure that at least a 0.20-in. water gauge higher pressure is provided in the adjacent areas.
7. Bench stations handling flammable, combustible, or corrosive materials are provided with ventilation hood systems.
8. Bench stations and hoods are made of noncombustible materials.

9. Ducting in ventilation systems are made of noncombustible materials or of materials that have a flame spread of 25 or less and smoke development of 50 or less.
10. All electrical equipment and wiring complies with NFPA 70.
11. Sprinkler protection is provided throughout the clean rooms, including under work benches and under exhaust hood systems.
12. Automatic smoke detection and alarm systems are provided throughout clean rooms.
13. Smoke detection is provided on a 200 ft<sup>2</sup> maximum spacing due to high air flows associated with clean rooms.
14. Smoke detection sounds internal evacuation alarms, actuates the smoke control system, and signals emergency fire department personnel.
15. CO<sub>2</sub> or sprinkler systems are provided for under-floor spaces over 5,000 ft<sup>3</sup> where the space contains power, communication, or data cables that are not located in approved conduit or metallic tubing.
16. HEPA filters used in clean rooms are UL listed.
17. HEPA filters and ducts are inspected frequently, and filters are cleaned or replaced on a regular schedule.
18. HEPA filters are not patched or plugged to improve their efficiency as this action adversely affects their fire resistance.
19. Exiting from clean rooms complies with NFPA 101.
20. Combustible or flammable liquids and corrosive liquids are limited to a 1-day supply in a clean room and are stored in approved safety containers. A maximum 10-day supply of combustible or flammable liquids and corrosive liquids may be located in a clean room provided they are stored in an approved noncombustible storage cabinet or locker. Separate all other combustible or flammable and corrosive liquids from the clean room by 1-hour fire rated construction.
21. Flammable gases used within clean rooms should have the supply cylinder or bulk tanks located outside the clean room separated by 1-hour fire rated construction.
22. All process and production areas are kept clean and free of all combustible materials such as cartons, papers, and packaging materials.

23. Portable fire extinguishers are provided per NFPA 10.
24. Detailed emergency procedures are posted in the clean room. Procedures should include instructions for shutting off all hazardous gases, maintaining fume exhaust systems, and sounding an evacuation alarm. Personnel should be trained in the emergency procedures.



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## **E. 8 Laboratories**

### **1. 0 SCOPE**

This procedure provides the fire protection requirements for laboratories. The scope of this procedure also requires compliance with the applicable sections of NFPA 451.

### **2. 0 REQUIREMENTS**

Management shall ensure that the following are accomplished.

1. Limit the quantity of hazardous chemicals stored in an open laboratory work area to the amount required for the specific task being performed.
2. Incompatible materials are segregated to prevent accidental contact with one another.
3. Containers of materials that may become hazardous over time are dated and inspected every 6 months to evaluate their condition. Materials that are safe may be redated, and those that can be made safe by treating them may be treated and redated. Safely discard all other materials.
4. Pressure relief systems discharge to a safe location.
5. All permanent piping is identified (as to its contents) at the supply and discharge points.
6. Operating controls for apparatus are accessible under normal and emergency conditions.
7. Entrances to laboratory units or areas are identified with signs to warn emergency personnel of unusual or severe hazards that are not related to the fire hazard of contents.
8. Documented monthly housekeeping inspections are performed for each laboratory, and corrective action is initiated immediately to resolve identified deficiencies.

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## E. 9 Pyrophoric Materials

### 1. 0 SCOPE

This procedure provides the design and operation requirements, and responsibilities where pyrophoric materials and combustible metals are stored, processed, or handled. For the purpose of this scope, a pyrophoric material is a material that ignites spontaneously when exposed to air. The scope of this procedure also requires compliance with the following standards as applicable:

NFPA 68, "Explosion Venting"  
 NFPA 69, "Explosion Prevention Systems"  
 NFPA 325M, "Fire Hazard Properties of Flammable Liquids, Gases, and Volatile Solids"  
 NFPA 480, "Storage, Handling, and Processing of Magnesium"  
 NFPA 481, "Production, Processing, Handling, and Storage of Titanium"  
 NFPA 482, "Production, Processing, Handling, and Storage of Zirconium"  
 NFPA 651, "Manufacture of Aluminum and Magnesium Powder"

### 2. 0 REQUIREMENTS

Management shall ensure that the following are accomplished.

1. The appropriate extinguishing agents are used where pyrophoric materials and combustible metals are processed, stored, or handled. Most pyrophoric materials react violently with water, foam agents, halogenated agents, and CO<sub>2</sub>. Some combustible metals cannot be extinguished with water and require special extinguishing powders (for Class D fires) or special inerting gases.
2. Processes involving pyrophoric materials are performed in an enclosed oxygen free, oxygen deficient, or inerting atmosphere that is moisture controlled (dry).
3. Whenever inert gas systems are used, a reserve supply of gas is available for emergency use.
4. Ordinary combustible materials, such as paper, wood, cartons, or packing material are not stored or allowed to accumulate near processes where pyrophoric materials and combustible metals are handled.
5. Smoking and uncontrolled use of open flames are prohibited where materials are processed, stored, or handled. Areas shall be clearly posted with "No Smoking" signs.
6. Nonsparking tools are used when handling combustible metal powders.

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## **E. 10 Portable Structures**

### **1. 0 SCOPE**

This procedure provides the fire protection requirements for portable structures.

### **2. 0 REQUIREMENTS**

Management shall ensure that:

1. The placement and use of all portable structures is reviewed by Fire Protection Engineering.
2. Portable structures comply with DOE/EV-0043, *Standard on Fire Protection for Portable Structures*, when any one of the following conditions exist:
  - a. Creates a life hazard
  - b. Endangers the public or environment
  - c. Replacement value (structure and contents) exceeds \$250,000
  - d. Is vital to a DOE program.

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## E. 11 Hazardous Material Storage

### 1. 0 SCOPE

This procedure provides the design and operation requirements, and responsibilities for hazardous material storage. Hazardous materials can include flammable and combustible liquids, gases, corrosives, oxidizers, water reactives, and radioactive materials. The scope of this procedure also requires compliance with the following standards as applicable:

NFPA 30, "Flammable and Combustible Liquids Code"  
 NFPA 43A, "Storage of Liquid and Solid Oxidizers"  
 NFPA 43B, "Storage of Organic Peroxide Formulations"  
 NFPA 43C, "Storage of Gaseous Oxidizing Materials"  
 NFPA 58, "Storage and Handling of Liquefied Petroleum Gases"  
 NFPA 59A, "Production, Storage, and Handling of Liquefied Natural Gas"  
 NFPA 231, "General Storage"  
 NFPA 231C, "Rack Storage of Materials"  
 NFPA 491M, "Hazardous Chemical Reactions"  
 NFPA 704, "System for Identification of the Hazards of Materials"

### 2. 0 REQUIREMENTS

Management shall ensure that the following are accomplished.

1. Hazardous material storage is separated by minimum distances from other facilities and personnel areas.
2. Incompatible hazardous materials in the same building are separated by suitable fire rated construction. A material that is incompatible with another is a material that can cause hazardous reactions or can promote or initiate combustion with the material. Examples of materials that require separation between each other are flammable and combustible liquids, corrosive materials, oxidizers, and water reactives.
3. Incompatible hazardous materials stored outside of buildings are separated from one another by minimum distances.
4. Hazardous materials are stored in the appropriate containers.
5. Hazardous material storage areas and buildings are provided with containment for liquid run-off control.
6. Hazardous material storage buildings and aboveground tanks are provided with fire protection.
7. Hazardous materials that may cause environmental damage in a fire are located in separate hazardous material containment buildings or tanks.



8. Separate hazardous material containment buildings are provided with fire sprinkler systems or other approved fire protection control and extinguishing systems.
9. Accumulation of combustible materials such as cartons, papers, and packaging materials is prohibited in and around hazardous material storage.
10. Weeds or similar combustibles are not permitted within 15 ft of hazardous material storage areas.
11. Portable fire extinguishers in hazardous storage buildings are provided for the appropriate hazard per NFPA 10.
12. Personnel involved in hazardous material operations receive instructions in handling the materials in a safe manner.
13. Smoking is not permitted in or near hazardous storage areas.
14. Storage facilities are not used as dispensing facilities.

## **E. 12 Hydrogen Systems**

### **1. 0 SCOPE**

This procedure provides the design and operation requirements, and responsibilities for the prevention of hydrogen fires where hydrogen is handled, stored, used in piping or in a process, discharged through valves into pressure containers, or flowing out of containers through nozzles. The scope of this procedure also requires compliance with the following standards as applicable:

NFPA 50A, "Gaseous Hydrogen Systems at Consumer Sites"  
NFPA 50B, "Liquefied Hydrogen Systems at Consumer Sites"  
NFPA 77, "Static Electricity"  
49 CFR 100-199, "Transportation"  
Compressed Gas Association Publications

### **2. 0 REQUIREMENTS**

Management shall ensure that the following are accomplished.

1. Gas or liquid hydrogen is stored in approved containers equipped with pressure relief devices.
2. Piping, tubing, fittings, valves, gauges, and regulators in hydrogen systems are suitable for hydrogen service.
3. Hydrogen storage is not permitted inside buildings other than in separate, specially designed buildings or rooms.
4. Storage containers, piping, valving, regulating equipment, and other accessories are readily accessible to authorized personnel and emergency fire department apparatus and are protected against physical damage.
5. Hydrogen systems are electrically bonded or grounded before discharging hydrogen.
6. Legible instructions are maintained at locations that require operation of hydrogen equipment by the user.
7. A qualified person is in attendance at all times when mobile hydrogen supply equipment is unloading hydrogen.
8. Each hydrogen system installed is inspected annually and maintained by qualified personnel.

9. Weeds or similar combustibles are not permitted within 15 ft of gaseous hydrogen system equipment or within 25 ft of liquefied hydrogen system equipment.
10. Personnel using hydrogen and hydrogen equipment are provided documented training on the fire hazards associated with hydrogen, e.g., the flames are practically invisible.

## **E. 13 Records Storage**

### **1. 0 SCOPE**

This procedure provides the design and operation requirements, and responsibilities for fire protection of records storage. This procedure does not consider requirements that may be part of a security program needed to prohibit forcible entry. The scope of this procedure also requires compliance with the following standards as applicable:

NFPA 232, "Protection of Records"  
NFPA 232AM, "Archives and Record Centers"  
NFPA 910, "Libraries and Library Collection"  
36 CFR, Chapter XII, "Records Management"

### **2. 0 REQUIREMENTS**

Management shall ensure that the following are accomplished.

1. Vital and important records (as defined by NFPA 232) are protected against fire.
2. Records that can be reproduced are duplicated and stored away from the originals so they will not be subject to the same fire incident.
3. Vital and important records are located and stored in noncombustible buildings protected with automatic sprinklers.
4. Areas that provide storage of vital and important records are provided with smoke detection systems.
5. Appropriate fire extinguishers are provided for record storage vaults, file rooms, and record storage areas.
6. Good housekeeping, orderliness, and maintenance of equipment are provided for record storage areas.
7. Record storage areas are posted as "No Smoking" areas.
8. File rooms and storage vaults are not used as working spaces.
9. Persons other than those authorized to handle records are not permitted in file rooms and record vaults.

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## E. 14 Aircraft

### 1. 0 SCOPE

This procedure provides the requirements for the design, operation, and responsibility of protecting aircraft fueling facilities and hangars. The scope of this procedure also requires compliance with the following standards as applicable:

NFPA 77, "Static Electricity"  
NFPA 407, "Aircraft Fuel Service"  
NFPA 409, "Aircraft Hangars"  
NFPA 410, "Aircraft Maintenance"  
NFPA 415, "Aircraft Fueling Ramp Drainage"

### 2. 0 REQUIREMENTS

Management shall ensure that the following are accomplished.

1. When a fire suppression system is required, the system shall comply with NFPA 16.
2. In hangars housing aircraft having wing areas in excess of 3,000 ft<sup>2</sup>, provide supplementary low-level fixed aqueous film-forming foam (AFFF) oscillating monitor nozzle systems in the main hangar area.
3. Foam concentrate tanks, proportioning equipment, and deluge valves shall be separated from main hangar areas by construction having a minimum 1-hour fire resistance rating.
4. Office areas located in hangar buildings shall be separated from main hangar areas by construction having a minimum 1-hour fire resistance rating.
5. Automatic wet-pipe sprinklers are provided in all areas of the hangar facility not provided with overhead AFFF sprinkler protection.
6. All hangars are provided with floor drains to accommodate liquid run-off from fire systems or spills.
7. Drainage systems are flushed thoroughly with high volumes of water at least annually, to ensure their operability.
8. Light and electrical fixtures in the main hangar area are rain tight.

9. Operation instructions for fire protection are permanently posted at each monitor nozzle station and at each manual deluge activation station.
10. Portable and wheeled fire extinguishers are provided in the main hangar areas and at fuel servicing locations per NFPA 10.
11. "No Smoking" signs are posted throughout main hangar areas and at aircraft fuel servicing locations.
12. Emergency fuel shutoff and electrical bonding systems are provided at all fueling locations.
13. Aircraft fuel servicing is done outdoors.
14. Only authorized personnel, trained in the safe operation of aircraft fuel servicing systems and their emergency controls, fuel and defuel aircraft.
15. Emergency fuel shutoff devices are inspected and tested at least every 3 months.
16. Aircraft fueling hoses are inspected daily before use. At least once a month the hoses shall be completely extended and inspected.
17. Fueling hoses are hydrostatically tested when signs of flattening, kinking, sharp bending, or crushing by a vehicle are indicated.

## **E. 15    Li ghtni ng**

### **1. 0    SCOPE**

This procedure provides the design and operation requirements, and responsibilities for lightning protection. The scope of this procedure also requires compliance with the following standards as applicable:

NFPA 70, "National Electric Code"  
NFPA 78, "Lightning Protection Code"  
FM 5-11, "Lightning Protection"

### **2. 0    REQUIREMENTS**

Management shall ensure that the following are accomplished.

1. Lightning protection systems are provided for facilities that handle, process, or store radioactive materials, explosives, or similarly hazardous materials; buildings containing high value equipment; and structures having a severe lightning risk value per NFPA 78, Appendix I.
2. Electric power and communication services to all facilities and underground power cables, where connected by overhead power distribution lines, have lightning and surge protection.
3. All lightning protection systems are maintained.
4. All lightning protection systems are visually inspected per NFPA 78, Appendix B, annually.
5. Complete in-depth testing and inspections per NFPA 78, Appendix B, are performed every 3 years on critical systems providing lightning protection for facilities involving radioactive or explosive materials.
6. Inspection and maintenance procedures are in place for personnel performing lightning protection system maintenance and inspections.
7. Inspection and maintenance records of the lightning protection systems are documented and maintained for auditing purposes.



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## **E. 16 Explosion Proof Electrical**

### **1.0 SCOPE**

This procedure provides the design and operation requirements, and responsibilities for explosion proof electrical installations. The scope of this procedure also requires compliance with the applicable NFPA standard addressing the specific operation or process, as well as the following standards:

- NFPA 70, "National Electrical Code"
- NFPA 493, "Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, III, Division 1 Hazardous Locations"
- NFPA 495, "Explosive Material Code"
- NFPA 496, "Purged and Pressurized Enclosures for Electrical Equipment"
- NFPA 497A, "Classification of Class I Hazardous Locations for Electrical Installations in Chemical Process Areas"
- NFPA 497B, "Classification of Class II Hazardous Locations for Electrical Installations in Chemical Process Areas"
- NFPA 497M, "Classification of Gases, Vapors, and Dusts for Electrical Equipment in Hazardous Locations"

### **2.0 REQUIREMENTS**

Management shall ensure that the following are accomplished.

1. Explosion proof electrical equipment of the proper classification is provided in locations where flammable vapors, liquids, gases, or combustible dusts or fibers may be present in concentrations sufficient to produce explosive or ignitable mixtures.
2. All explosion proof electrical equipment used is UL listed or FM approved for use in the appropriate hazardous atmosphere.
3. No alterations or modifications are made to listed or approved equipment for hazardous locations. If modifications are made, the equipment shall be void for use in a classified hazardous location.

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## E. 17 Lasers

### 1. 0 SCOPE

This procedure provides the design and operation requirements, and responsibilities for laser operations. The scope of this procedure also requires compliance with the following standards as applicable:

NFPA 70, "National Electrical Code"

American National Standards Institute ANSI /Z136.1, *Safe Use of Lasers*

### 2. 0 REQUIREMENTS

Management shall ensure that the following are accomplished.

1. All class lasers and laser systems have protective housings, interlocks, circuit breakers, insulation, switching devices, and the appropriate affixed warning labels.
2. When a high-valued laser system is located in a building, the building is protected by automatic fire detection and fire sprinkler systems.
3. All electrical equipment is installed in accordance with NFPA 70.
4. All laser system frames, enclosures, and other accessible non-current-carrying metallic parts are grounded.
5. Lasers and laser systems are operated and maintained only by authorized employees.
6. Employees involved with lasers and laser systems are properly trained.
7. Procedures are developed for the proper installation and use of all laser systems.
8. Beam target areas of Class IV lasers (per ANSI Z136.1) are free of combustible and flammable materials.
9. Lasers using flammable liquids are provided with effective means of controlling liquid fires.
10. Experimental lasers that (1) are not listed or approved for use in classified hazardous locations and (2) have unique electrical components are provided with the necessary precautions to control all fire hazards.

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## E. 18 Paint Spray Operations

### 1. 0 SCOPE

This procedure provides the general requirements for the spray application of flammable and combustible materials. The scope of this procedure also requires that the design, installation, and protection of spray application systems comply with the following standard:

NFPA 33, "Spray Application Using Flammable and Combustible Materials"

### 2. 0 REQUIREMENTS

Management shall ensure that the following are accomplished.

1. Spray operation areas are provided with continuous mechanical ventilation systems that are adequate to confine overspray and keep concentrations of flammable vapors below 25% of the lower flammable limit.
2. Spray areas are protected with an approved automatic fire protection system.
3. Procedures are established to ensure the following.
  - a. Collection filters are replaced before there is an excessive restriction in air flow, and used filters are disposed of at a location detached and outside of the building or in a water-filled metal container.
  - b. Overspray at the work area, in the plenum behind the filters, and in the exhaust duct is cleaned. (The cleaning solvent should have a flashpoint above 100 °F except for cleaning spray nozzles.)
  - c. Rags and waste impregnated with overspray are disposed of in approved metal containers.
4. "No Smoking" signs are posted in spray areas and paint storage rooms.
5. Employees involved with the spray operations receive instruction in potential safety and health hazards, and operational and emergency procedures.
6. The quantity of flammable and combustible liquid stored in the vicinity of spray operations is in accordance with the requirements in C. 5, "Flammable and Combustible Liquids."

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## **E. 19 Dormi t o r i e s**

### **1. 0 SCOPE**

This procedure provides requirements for DOE-owned and -leased dormitories. The scope of this procedure also requires compliance with the applicable sections of NFPA 70.

### **2. 0 REQUIREMENTS**

Management shall ensure that the following are accomplished.

1. Dormitories are designed in accordance with NFPA 101.
2. Dormitories over 20,000 ft<sup>2</sup> are provided with 2-hour fire separation barriers, so no single fire area exceeds this size.
3. Nonmetallic sheathed cable is not used in steel stud partitions or concrete construction.
4. Dormitory exits are maintained in accordance with Section D. 3, "Building Exits."



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## **E. 20 Decommissioning of Facilities**

### **1. 0 SCOPE**

This procedure provides the fire protection requirements for facilities being decommissioned. The scope of this procedure also requires compliance with the applicable sections of NFPA 241.

### **2. 0 REQUIREMENTS**

Management shall ensure that the following are accomplished.

1. Fire suppression systems are maintained operable to the extent possible during decommissioning activities.
2. During cold weather operations, provide temporary heating equipment for the facility so installed sprinkler systems can be maintained operable.
3. If operations require the use of explosives, provide at least two 1 1/2-in. hose lines, or one 2 1/2-in. hose line, at the immediate vicinity of the site during the actual detonation.
4. Electrical service is reduced to the minimum required for decommissioning, and all energized circuits are clearly identified.
5. Smoking is prohibited throughout the decommissioning area.
6. Flammable and combustible liquids are removed from the facility before any demolition is initiated.
7. A means for emergency notification is provided at the decommissioning area.
8. Free and unobstructed access is maintained at the decommissioning area for emergency response vehicles.

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## **E. 21 Combustion Controls**

### **1. 0 SCOPE**

This procedure provides the fire protection requirements for boilers, ovens, and furnaces.

### **2. 0 REQUIREMENTS**

Management shall ensure that the following are accomplished.

1. Boilers, ovens, and furnaces are designed in accordance with the applicable NFPA standards.
2. The equipment is started using only the igniters designed for the equipment.
3. All systems are provided with basic interlock systems to prevent improper operation of the equipment and to limit actions to those prescribed for the proper operating sequence.
4. All systems are provided with automatic safety features that prevent the systems from approaching an undesirable or unstable operating condition.
5. All interlock and automatic safety systems have audible and visual annunciation to indicate abnormal conditions.
6. All interlock and automatic safety systems are placed on a regular testing schedule to ensure they function as intended. Report and correct any defects identified and document the repairs.
7. All equipment have normal and emergency operating procedures in place, and the procedures are reviewed regularly to ensure they are current.
8. All operators receive formal training so they are prepared to operate the equipment safely and efficiently.

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## **APPENDIX F**

### **FIRE DEPARTMENT OPERATIONS AND EMERGENCY RESPONSE- - SAMPLE PROCEDURES**

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# CONTENTS

C - PERIODIC RESPONSIBILITIES AND DUTIES.....	F- 5
I.    PURPOSE.....	F- 5
II.   GENERAL INFORMATION.....	F- 5
III.  ROTATING GROUP ASSIGNMENT SCHEDULES.....	F- 5
IV.   GROUP 1 ASSIGNMENT RESPONSIBILITIES.....	F- 5
V.    GROUP 2 ASSIGNMENT RESPONSIBILITIES.....	F- 6
VI.   GROUP 3 ASSIGNMENT RESPONSIBILITIES.....	F- 6
VII.  SPECIAL RESPONSIBILITY ASSIGNMENTS.....	F- 7
VIII. VEHICLE REPAIR AND MAINTENANCE.....	F- 8
IX.   STATION MAINTENANCE.....	F- 8
X.    ANNUAL ACTIVITIES (ALL STATIONS).....	F- 8
XI.   SEMI ANNUAL ACTIVITIES (ALL STATIONS).....	F- 9
XII.  MONTHLY DUTIES.....	F- 9
XIII. WEEKLY DUTIES.....	F- 11
XIV.  DAILY ACTIVITIES.....	F- 13
H - NOTIFICATION OF ABSENCES.....	F- 15
I.    PURPOSE.....	F- 15
II.   RESPONSIBILITY.....	F- 15
III.  NOTIFICATION.....	F- 15
IV.   DOCUMENTATION.....	F- 16
V.    VOLUNTEER EMERGENCY SERVICE.....	F- 16
K - EMERGENCY RESPONSE PROCEDURE.....	F- 17
I.    PURPOSE.....	F- 17
II.   SCOPE.....	F- 17
III.  SPECIFICATIONS FOR PERSONNEL.....	F- 17
IV.   SPECIFICATIONS FOR PROTECTIVE CLOTHING AND RESPIRATORY PROTECTION.....	F- 18
V.    INCIDENT COMMAND.....	F- 19
VI.   SPECIFIC INCIDENT SAFETY REQUIREMENTS.....	F- 19
VII.  HAZARDOUS MATERIALS.....	F- 19
VIII. SPECIFICATIONS FOR POST-INDICATOR VALVE CONTROL DURING SPRINKLER SYSTEM ACTIVATIONS.....	F- 19
IX.   RADIO COMMUNICATION BACKUP.....	F- 20
X.    AMBULANCE RESPONSES.....	F- 20
L.  FACILITY CONTROL IN EMERGENCY SITUATIONS.....	F- 23
I.    PURPOSE.....	F- 23
II.   FIRE DEPARTMENT MISSION.....	F- 23
III.  AUTHORITIES.....	F- 23
IV.   EMERGENCY COMMAND CONTROL.....	F- 24
V.    BUILDING EMERGENCY DIRECTOR AND DESIGNATED ALTERNATE SUPPORT.....	F- 24
VI.   COMMAND POST.....	F- 25
VII.  COMMAND POST FLAG STANDARD.....	F- 26



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## APPENDIX F

### FIRE DEPARTMENT OPERATIONS AND EMERGENCY RESPONSE- - SAMPLE PROCEDURES

#### C - PERIODIC RESPONSIBILITIES AND DUTIES

##### I. PURPOSE

- A. To define the periodic duties and responsibilities of the members of the department.
- B. To divide the duties among the three platoon shifts and the Testing and Services (T&S) personnel.

##### I. GENERAL INFORMATION

- A. Certain areas of the fire stations, and the department vehicles and equipment are divided into three groups. Each platoon is responsible for one group as their responsibility. Groups are rotated every 6 months. Some functions are assigned to individuals on a permanent basis.

##### III. ROTATING GROUP ASSIGNMENT SCHEDULES

<u>Period</u>	<u>'A' Platoon</u>	<u>'B' Platoon</u>	<u>'C' Platoon</u>
3/1/91-9/1/91	1	2	3
9/1/91-3/1/92	2	3	1
3/1/93-9/1/93	3	1	2
9/1/93-3/1/94	1	2	3

##### IV. GROUP 1 ASSIGNMENT RESPONSIBILITIES

###### A. All stations

- 1. Alarm room, all offices, hose tower, hose storage and breathing air compressor room, boiler room, equipment storage room, and emergency generator room.
- 2. Hose on assigned equipment.

###### B. Station A

- 1. Engine 1, T-1, lawn mower.
- 2. 185-N hydrant hose boxes.

C. Station B

1. Engine 2, T-2, Unit 1 and Unit 2, lawn mower.
2. Jaws on E-2 (H0-30-3977).

D. Station C

1. Engine 3, T-3
2. Jaws on E-3 (H0-30-3960)

E. Station D

1. Engine 4, T-4, and jaws (H0-30-5033)

**V. GROUP 2 ASSIGNMENT RESPONSIBILITIES**

A. All stations

1. All bathrooms, bedrooms, hallway, shop, storage rooms, warehouses, and outside grounds.
2. Hose on assigned equipment.
3. All station ladders (fixed and portable).

B. Station A

1. Engine 11, T-11, Unit 11, slip-in pump (H0-49-8085).

C. Station B

1. Engine 22, Unit 3, and HAZMAT 1.

D. Station C

1. Engine 33, HAZMAT 3, portable pump (H0-49-15819), Unit 31, slip-in, ambulance 3, auxiliary pump H0-49-18639.

E. Station D

1. Engine 44 and ambulance 4

**VI. GROUP 3 ASSIGNMENT RESPONSIBILITIES**

A. All stations

1. Kitchen, dining and squad room, and apparatus room.
2. All hose in hose racks, including warehouse.

**B. Station A**

1. Ambulance 1 and ambulance 5, S-1 auxiliary pumps 49-18678 and 49-15818.
2. All hose in hose rack and warehouse.

**C. Station B**

1. Ambulance 2, Unit 21, and slip-in pump (H0-49-5523), portable pump, Attack 1 and portable generator (H0-74-5821), chlorine tank trailer, U-3
2. All hose in hose racks.

**D. Station C**

1. Portable pump (H0-59-18679), Unit 31, and slip-in pump (H0-49-5086), T-33

**E. Station D**

1. Mobile air 1 and auxiliary generator (H0-74-5609), MX-4, Unit 41, and slip-in pump (H0-49-5087)
2. Hose in hose rack

**VII. SPECIAL RESPONSIBILITY ASSIGNMENTS****A. Testing and Services (all stations)**

1. All T&S vehicles
2. T&S managers will schedule maintenance and repairs on the above vehicles and on U-1, U-2, and U-4.

**B. "A" Platoon (all stations)**

1. Maintain laundry and dry cleaning records.
2. Care and upkeep of the foam generator assigned to the 100 Area Fire Station (H0-50-15802).

**C. "B" Platoon (all stations)**

1. Maintain all hose records. This includes any necessary revisions to maintain accurate and current records.
2. Make history card records for all hose.
3. Care and upkeep of foam generator assigned to Station 2 (H0-50-1927).

D. "C" Platoon (all stations)

1. All station filing, as needed.

## VIII. VEHICLE REPAIR AND MAINTENANCE

- A. The battalion commander, or delegate, will normally schedule vehicle repair or maintenance work for all platoon vehicles.
- B. T&S officers will schedule vehicles assigned to their group.
- C. Fire Department Maintenance Request forms must be completed and accompany each vehicle.

## IX. STATION MAINTENANCE

- A. Station repair and maintenance will be handled by T&S planners north of the Wye Barricade and by the T&S captain south of the Wye Barricade.
- B. Maintenance Request forms must be submitted to the above individuals to schedule repair activity.

## X. ANNUAL ACTIVITIES (ALL STATIONS)

- A. Perform building tours in all facilities requiring annual inspections.
- B. Perform hydrant flow testing during March and April.
- C. Inspect and winterize hydrants during September and October.
- D. Perform annual service test on all apparatus during the month of May. Reports are then forwarded to the deputy chief. An annual service test log for all equipment will be maintained in each station.
- E. Test hose in racks during the last 2 weeks of April and first 2 weeks of May.
- F. Test all other fire hose during May and June.
- G. Test all portable ladders in June (officers conduct test; training officer coordinates).
- H. Test all telesquirt ladders in June (performed by offsite vendor; training officer coordinates).

## **XI. SEMI ANNUAL ACTIVITIES (ALL STATIONS)**

- A. Perform building tours in all facilities requiring semi annual inspections.
- B. Rotate station and equipment assignments on March 1 and September 1.
  - 1. Immediately after rotation of responsibilities, all rooms, walls, and floors are to be thoroughly cleaned.
  - 2. Immediately after rotation, a thorough vehicle equipment inventory will be conducted by the responsible shift against the inventory listed for that vehicle. All equipment must be listed in alphabetical order on the back of the equipment inventory sheet along with the appropriate compartment (RF = right front, LF = left rear, etc.). All shortages will be noted and referred to the training officer. Any inventory revision will require deputy chief or training officer's approval. Complete inventory sheets are to be attached to the driver's door.
- C. Check any first aid kits in suppression vehicles. Ensure they are complete and replace old or outdated material.
- D. Wash and wax all equipment following 6-month assignment rotation.
- E. The shift on duty in each station will inspect the fire barriers on March 1 and October 1.
  - 1. The inspecting shift will document this inspection on the appropriate form.

## **XII. MONTHLY DUTIES**

- A. Each month
  - 1. Shift officer conducts safety and security meetings, including filling out the documentation form for the meeting. Send a copy of the form to the training department.
- B. First part of each month
  - 1. Perform safety inspection of all stations.
  - 2. Check fire extinguishers in all stations and document.
- C. First monthly duty day (all stations)
  - 1. Telesquirt maintenance and records to be completed by responsible platoons.
  - 2. All drivers licenses will be checked, including state and government documents.

3. Each platoon will check their bunker gear, fill out the appropriate form, and submit it to their shift officer for filing. Any off-standard condition must be reported to the battalion commander on duty.

4. Assigned platoon checks fixed and portable ladders.

a. Document on appropriate form. Check off sticker on beam of portable ladders; replace sticker if necessary.

5. Wash windows in assigned areas, inside and out.

D. First Sunday each month

1. Make full operational inspection of all masks by putting masks in service. Document on card.
2. Check all portable radios assigned to platoon against the master station list and send to the headquarters clerk for corrections and filing. The clerk will update the inventory and send a copy to the stations for posting. Missing radios or changes must be reported to the battalion commander immediately.
3. Perform monthly inspections on hazardous materials suits.
4. Pocket alarm dosimeter instruments (PADI) are to be tested by platoon on duty. T&S personnel will test their own units.

E. Second Sunday each month

1. Batteries for portable headset radios in HAZMAT-1 will be tested and replaced if needed.
2. Two-way head sets on each tanker will be tested and replaced, if needed.
3. Check all batteries on equipment if they are not the maintenance-free type, and check emergency power plants.
4. Recharge lanterns, weather station, and explosion meter on HAZMAT units by plugging into a power source. This equipment should not be charged for more than 12 hours except when it has been used and needs recharging.
5. Discharge all SL-20 flashlights and recharge.
6. Inventory all keys assigned to platoon.

F. First monthly Saturday and Sunday

1. Responsible platoons to strip, when necessary, and clean and

wax floors in assigned station area.

G. First Tuesday each month

1. Run emergency generators for 7 minutes at Station 1
2. Record liquid petroleum gas level before and after test. Notify Fire Department clerk if liquid petroleum gas is low (below 50%).

H. First Wednesday each month

1. Inventory ambulances

I. Last Friday of each month

1. Check first aid kits on T&S vehicles.
2. Check all equipment for lubrication and Class A due dates. Give information to T&S officer.

J. Last Saturday of each month

1. Check all equipment for lubrication and Class A due dates. Send completed sheets to battalion commanders.

### XIII. WEEKLY DUTIES

A. Each Sunday

1. Visually inspect all masks. Document on records.
2. Roll and rack dry hose in tower. Graphite 2 1/2-in. couplings.
3. Check all breathing air bottles for adequate air supply. Refill, if necessary. NOTE: Minimum air pressure for high pressure cylinders is 4,200 psi.
4. Empty, wash out, and refill water and ice containers on tankers and power wagons during usage months (normally March through September).
5. After 1,500 hours, prepare soiled uniform and bedding laundry for vendor pickup.
6. Inventory station supplies (all stations). Send order to department clerk.
7. Mop and buff floors in assigned areas.

B. Each Monday



1. Station 2, fold and properly store laundry.
2. Check and air all tires; visually ensure all lug nuts are in place and tight.
3. Dip fuel tanks and record on fuel disbursement log. Inventory credit cards. Deliver paperwork to Fire Department clerk by 8:30 a.m. on Tuesday.
4. Log liquid petroleum gas percentage from tanks at 100 and 200 Stations.
5. Inspect satellite accumulation areas and log the inspection.
6. The eyewash stations in Fire Stations 1 and 3 are to be inspected each Monday evening.

C. Each Tuesday

1. Stations 1 and 4 fold and properly store laundry.
2. Station 3, check emergency gate operation. If problems are found, notify Security.

D. Each Wednesday

1. All stations prepare uniform laundry and bedding for Thursday pickup.
2. Weather permitting, move all apparatus out of the station and run at ~1,000 rpm until engines come up to normal temperature.
3. Flush apparatus floor and ramps.
4. Assigned platoon cleans warehouses and maintains them in a neat and orderly manner.
5. Clean locker tops and light fixtures.
6. Check filter masks on tanker equipment. Obtain replacements from shop technician, if needed. Ruptured bags must be checked by Health Physics.

E. Each Thursday

1. Clean kitchen cupboards, stove, counter tops, oven, and air filters. Wash out garbage containers. Scrub and clean showers.

F. Each Friday

1. Stations 2 and 3 fold towels. Properly store in assigned location.

2. T&S personnel clean assigned vehicles.
3. Dry cleaning to be checked by name and payroll number. Note and report discrepancies, including repairs.

G. Each Saturday

1. Weather permitting, move all apparatus out of the station and run at ~1,000 rpm until engines come up to normal temperature. All specialized equipment such as the chemical truck, HAZMAT vans, and attack truck are to be driven to ensure reliability.
2. Run and check all motors on equipment. This includes portable pumps, power plants (including power plant on HAZMAT 2), tankers, foam generators, and the K-12.
3. Mow lawns.
4. Water lawns after mowing, and water trees.
5. Operate and check AC converters on equipment and jaws.
6. Mop and buff floors in assigned station areas.
7. When assigned, flush apparatus floors and ramps.
8. Operate and check all discharge and intake valves, water governors, changeover valves, and telesquirt ladders.

#### XIV. DAILY ACTIVITIES

- A. Before 7:30 a.m., off-going platoons clean the offices and kitchen areas and make them presentable for the days' business activities. Each shift must leave the station clean and neat for the oncoming shift. This includes sweeping or mopping; emptying wastebaskets; and dusting desks, file cabinets, and associated furnishings, if needed. Remove sheets and make up beds.
- B. Incoming shift stores personal belongings neatly (nothing on beds).
- C. Check radios, inventories, and vehicle fuel levels. The battalion commander should be informed of any maintenance needs.
- D. Perform radio check with hospital on the following schedule:
 

Monday - A-1	Tuesday - A-2	Wednesday - A-3
Thursday - A-4	Friday - A-5	
- E. Check personal alert safety system (PASS) alarms. Report deficient units to shift officer.

- F. Officer on duty will make daily assignments, read current clipboard material, and pass on any other pertinent information.
- G. Ice water jugs on tankers and power wagons (during grass fire season).
- H. Clean and mop squad and dining rooms, kitchens, bedrooms, and bathroom floors.
- I. Mop any other station floors, as needed.
- J. Damp mop ambulance floors following shift change (and also after response, if needed).
- K. Bleed water accumulation from air tanks on equipment having compressors.
- L. Run and check mounted motors.
- M. Water lawn as needed.
- N. Wash and sweep Units 1, 2, 3, and 4, as needed.
- O. Maintain station and equipment in ready for emergency response.

## H - NOTIFICATION OF ABSENCES

### I. PURPOSE

- A. To establish the proper method of notifying the Fire Department because of absence.
- B. To establish a uniform criteria for documenting the reason for absence.
- C. To provide criteria for absence due to voluntary community firefighting.

### II. RESPONSIBILITY

- A. All fire department personnel are expected to maintain and promote good work habits regarding work attendance and productivity.
- B. All fire department members are responsible for properly notifying their immediate supervisor of an absence.
  - 1. This will include personal business (E) time.
- C. The on-duty shift officer is responsible for receiving absence reports and for passing such information to the oncoming duty officer and battalion commander.
- D. The shift officers are responsible for noting absences in the logbook and completing the Reason for Absence form.
- E. The oncoming battalion commander is responsible for tallying an absence report for the department and for passing that information to the chief.

### III. NOTIFICATION

- A. All fire department members must report absences in sufficient time to allow their officer to arrange for a replacement, when necessary.
  - 1. Platoon firefighters should call by 7:00 a.m. to report an absence.
  - 2. T&S firefighters should call by 6:50 a.m., using a T&S phone number.

If absences are to be for a prolonged period of time, the employee must keep the officer informed as to the firefighter's status and expected return date.

#### IV. DOCUMENTATION

- A. To fairly and evenly account for personal business and personal illness absence time, the Fire Department will adopt minimum requirements for completing the Reason for Absence form.
- B. The form will be completed for each of the above mentioned absences.
  - 1. The form, when completed, will be sent to the battalion commander for review.
  - 2. Following the review, the form will be sent to Central Files at Fire Department headquarters.
- C. In a personal illness, the following questions will be answered and recorded in the remarks section:
  - 1. Was a physician visited?
  - 2. Is there prescription medication being taken? If yes, does the medication limit work activities?
  - 3. Are there any residual signs or symptoms of the illness that could limit work activities?
- D. The form should be filled out by the immediate supervisor in the presence of the employee in a short meeting reserved for that purpose.
- E. Failure to fill the form out correctly limits the ability of the supervisor to manage his employees safely and in a productive manner.

#### V. VOLUNTEER EMERGENCY SERVICE

- A. Fire Department personnel who are actively involved in volunteer emergency services, such as a volunteer fire department, will not be granted absence time.

## **K - EMERGENCY RESPONSE PROCEDURE**

### **I. PURPOSE**

- A. To provide consistent and safe personnel preparation for response to emergency events.
- B. To acknowledge and reinforce certain incident safety requirements specified in NFPA 1500.
- C. To endorse a system of incident command and specify a set of hazardous materials operational procedures.

### **II. SCOPE**

- A. This procedure applies to all Fire Department personnel involved in emergency response activities.

### **III. SPECIFICATIONS FOR PERSONNEL**

- A. Boarding requirements
  - 1. On station receipt of an alarm, firefighters should respond directly to assigned positions on the apparatus.
  - 2. Bunker gear may only be donned while standing on the apparatus bay floor. Bunker boots, pants, and helmets with eye protective face shields are required before boarding. Bunker coats may be worn at the discretion of each firefighter and must be donned either before boarding or on arriving at the scene. If the firefighter decides not to wear full bunker gear until arriving at the scene, the individual is responsible for ensuring all gear is secured. Engine drivers are exempt from wearing bunker gear during responses.
  - 3. It is mandatory that all members, either riding or driving, buckle their seat belts before the vehicle moves. A thumbs up indication from the back seat to the cab signals a member's readiness. The engine operator and officer will work as a team to verify that back seat personnel give a thumbs up indication. Only after receiving this signal will the engine operator place the vehicle in motion.
  - 4. Vehicles must be operated in accordance with standard emergency vehicle accident prevention safe practices.

#### IV. SPECIFICATIONS FOR PROTECTIVE CLOTHING AND RESPIRATORY PROTECTION

- A. Use protective clothing and equipment whenever a potential exists for exposure to the hazards for which they are provided. It is required that full protective clothing--which includes coats, trousers, helmets with face shields, gloves, boots, and hoods--be worn at all times when involved in or exposed to the hazards of structural firefighting. Protective clothing requirements for other situations will be determined by the shift officer, based on the conditions encountered.
- B. During grass firefighting activities, yellow jumpsuits, helmets with face shields, gloves, and bunker boots will be worn. Bunker pants and coats may be worn as a backup when a jumpsuit is unavailable.
- C. Provide a self-contained breathing apparatus (SCBA) to be used by all personnel working in areas where the atmosphere
  - Is hazardous
  - Is suspected of being hazardous
  - May rapidly become hazardous.
- D. In addition to the above, provide all personnel working inside any confined space with an SCBA. Have them use an SCBA unless the safety of the atmosphere can be established by testing and be continuously monitored.
- E. The required use of an SCBA means that the user must have the facepiece in place, breathing air from the SCBA only. Wearing an SCBA without the facepiece in place does not satisfy this requirement and should be permitted only under conditions in which the immediate safety of the atmosphere is ensured. All members working in proximity to areas where SCBA use is required should have an SCBA on their backs or immediately available for donning.
  1. Areas where the atmosphere can rapidly become hazardous could include rooftop areas during ventilation operations and areas where an explosion or container rupture could be anticipated.
  2. A hazardous atmosphere would be suspected in overhaul areas and above the fire floor in a building. Members working in these areas are required to use their SCBA unless the safety of the atmosphere is established by testing and maintained by effective ventilation. With effective ventilation in operation, face pieces could be removed, when approved by supervision, but SCBA should continue to be worn or immediately available.

## **V. INCIDENT COMMAND**

- A. The National Fire Academy's Incident Command System (ICS), for control and coordination of the emergency scene, is used for incident command.

## **VI. SPECIFIC INCIDENT SAFETY REQUIREMENTS**

- A. Members operating in hazardous areas shall work in groups of two or more. Members outside the hazardous area shall maintain an awareness of the position and function of all persons operating within the hazardous area.
- B. Whenever members are operating in positions or performing functions that include special hazards, or that would result in injury because of equipment failure or other unforeseen event, backup personnel shall stand by with equipment to provide assistance or rescue.
- C. When members are operating in areas or performing functions that involve an immediate risk of injury, qualified basic life support personnel shall stand by with medical equipment and transportation capability.
- D. When inexperienced members are working at an incident, more experienced officers or members shall provide direct supervision.

## **VII. HAZARDOUS MATERIALS**

- A. The Fire Department will conduct operations at the site of a HAZMAT event in accordance with standard tactical and environmental practices. Refer to the Hazardous Materials Program for specifications and description of HAZMAT response procedures.

## **VIII. SPECIFICATIONS FOR POST-INDICATOR VALVE CONTROL DURING SPRINKLER SYSTEM ACTIVATIONS**

- A. To reduce unnecessary water damage and ensure immediate re-activation of the sprinkler system should a rekindle occur, a firefighter will be positioned at the post-indicator valve (PIV) as part of standard fire scene operations.
- B. The battalion commander or senior officer in charge of a fire scene should direct the second responding engine company officer to position a firefighter at the appropriate sprinkler system PIV or OS&Y valve immediately after the determination has been made that the fire is contained. That firefighter will remain there until extinguishment and overhaul have been completed.



## IX. RADIO COMMUNICATION BACKUP

- A. Due to the architecture and construction of process plants and vessels, radio signal communication between interior and exterior fire department forces may be disrupted or eliminated when working in certain facilities. If forces are committed to a working emergency situation in such a locale, incident command will assign a sufficient number of "runners" to provide a communication link between interior and exterior forces.
- B. When an internal plant frequency is available, the Fire Department will maintain and use radio equipment to interface with the existing system.

## X. AMBULANCE RESPONSES

- A. When ambulance calls are received, the station officer and ambulance crew are responsible for verifying the location with the radio operator before responding.
- B. Two firefighters will respond on all ambulance runs. One of the two must be an emergency medical technician (EMT).
- C. The ambulance crew will generally pick up the nurse and transport her or him to the scene.
- D. Ambulance reports must be filled out on all ambulance runs, even if no patient is transported. Information on these reports is considered confidential and should be released only to the proper authorities. Patients refusing treatment should sign the ambulance report to document the refusal. If the patient will not sign the form, note that information on the form.
- E. Patient status information will be transmitted to the hospital by radio. In general, the EMT should transmit the information, although the nurse may perform this duty on request. Patient names must not be transmitted over the radio, although payroll numbers may be used, when necessary. Status information should include the following:
  - 1. Description of accident or illness, including mechanism of injury.
  - 2. Severity and priority information, i.e., immediately life threatening, urgent, or nonurgent.
  - 3. Radiation concerns, if any.
  - 4. Vital signs, including age, sex, mechanism of injury, blood pressure, pulse, respirations, level of consciousness, estimated time of arrival, and any other pertinent information.
  - 5. Any medications or other compounds that may have contributed to

the patient's illness. If possible, the bottle or container should be delivered to the hospital with the patient to aid in identifying the proper antidote.

- G. Should an unattended death occur within the plant boundaries, the coroner and the Sheriff's Office or local police must be notified. Permission must also be obtained to move the body, except when medical personnel determine there may be a possibility of saving the victim. Transportation of deceased persons will be performed at the request of the coroner.

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## **L. FACILITY CONTROL IN EMERGENCY SITUATIONS**

### **I. PURPOSE**

- A. To identify conditions and periods when Fire Department command personnel are to assume event scene emergency control.
- B. To identify conditions and situations whereby building emergency directors (BED) delegate control of their facility to the Fire Department for the sole purpose of terminating fire service related emergency incidents.
- C. To recognize how Fire Department command posts and points are established and identified.
- D. To establish a basis for coordination between, and integration of, the response elements from the Fire Department and other contractor emergency command posts and centers.
- E. To establish a sitewide contingency plan that describes the overall Fire Department contingency program to meet the primary objective of the DOE orders and directions.

### **II. FIRE DEPARTMENT MISSION**

- A. The Fire Department provides total fire suppression, emergency rescue, ambulance, and nonradioactive HAZMAT response services for all DOE facilities and contractors located within the confines of the site or under contractual agreement. Other services include fire alarm system inspection and testing, prefire planning, and SCBA maintenance and certification.

### **III. AUTHORITIES**

- A. Overall responsibility for facility operations, including safety of building personnel, will always remain with the BED. Transfer of control of the event scene to the Fire Department will require coordination with the BED to determine all potential hazards based on facility knowledge, e.g. criticality and reactor operations.
- B. Under emergency fire, rescue, and HAZMAT situations, the Fire Department will take appropriate actions to control the emergency and provide emergency medical services to personnel. Specific emergency control authority will normally be passed from the BED to the Fire Department under emergency situations only.

- C. If the BED cannot be promptly contacted, the Fire Department will assume full authority to control the emergency situation until the incident is terminated. This delegation of authority is based on prefire plans, jointly approved by the Fire Department and building management.
- D. Fire command officers will maintain full authority to terminate and discontinue efforts for human rescue, attempted recovery of vital equipment, and body recovery, including the discontinuing of firefighting efforts, using the following self-radiation monitoring conditions

**Maximum Permissible Exposure to Each Firefighter**

To effect human rescue - - - - - 100 rem  
 To save vital equipment - - - - - 10 rem  
(25 rem voluntary)  
 Body recovery - - - - - 3 rem

#### **IV. EMERGENCY COMMAND CONTROL**

- A. In fire, medical, and HAZMAT situations, the BED passes control of the scene to the Fire Department. This allows the Fire Department to use its knowledge and expertise in controlling and terminating the emergency.
- B. The BED shall maintain total facility responsibility and will provide support to the Fire Department. However, the Fire Department is ultimately responsible for putting out the fire, stabilizing a HAZMAT incident, and rescuing personnel, and will determine what methods will be used, with consultation with the BED.
- C. Once the fire, HAZMAT, or rescue emergency is terminated, control of the event will be returned to the BED. The Fire Department will then assume a support role and provide any necessary assistance as requested by the BED.
- D. When assistance is requested on a standby support basis, the Fire Department will respond and take appropriate action, as determined jointly by the BED and the officer in charge.

#### **V. BUILDING EMERGENCY DIRECTOR AND DESIGNATED ALTERNATE SUPPORT**

- A. On all emergency responses to facilities, a BED is to report to the first-arriving vehicle to verify conditions.
- B. In all fire related situations, the BED will report to the officer in charge of the fire truck or the Fire Department command post and senior fire officer.

- C. The BED is to provide the Fire Department with information about known conditions and hazards.
- D. The BED is to advise the Fire Department if a rescue attempt is required.
- E. If radiological conditions exist, the BED will ensure that monitoring assistance is provided.
- F. The BED will provide any other available assistance, as requested by the Fire Department.
- G. If the BED does not report to the fire truck or command post area, the officer-in-charge may use his vehicle public address (PA) system to make an announcement requesting the BED to contact the senior fire officer on the scene.
- H. The BED is free to use the Fire Department vehicle PA system to make announcements to building personnel, unless such use interferes with Fire Department emergency operations.
- I. The BED shall have the responsibility and the authority to notify building personnel that the incident is controlled and the affected area may be reentered.

## VI. COMMAND POST

- A. The Fire Department command post is to be established at a safe distance from the event site, out of the way of responding emergency vehicles.
- B. The command post function provides a central location where incident information is assembled and incident decisions will be made to control the event as quickly and safely as possible.
  - 1. An ambulance should be located at the command post on any major emergency and on large grass fires. This will be at the discretion of the incident commander.
- C. The command post must have communication ability with all organizations working to control the emergency event.
- D. If the command post is not identified by flagging, the field contact point will be at the location of the first-arriving Fire Department vehicle.
- E. Command post flagging will not be initiated until it has been determined that an actual emergency exists and that control of the event will require time and/or support.

**VII. COMMAND POST FLAG STANDARD**

- A. Only one flag standard with reddish-orange plastic flags will be used to denote the command post.
- B. All Fire Department responding personnel, building emergency personnel, and security personnel will report to the command post or another mutually agreed upon staging area.